Spatial representation through graphic narrative: a practical approach

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Abstract

Narrative is a form of production that incorporate elements such as characters, time, and space. These elements work together to convey subject actions in a temporal context, and can be communicated through verbal, written, and visual forms. The spatial information in different narrative forms is represented using a variety of tools and methods. Bakhtin's concept of "chronotope" highlights the interdependent nature of time and space in textual narratives and can be applied to visual narratives. The potential of graphic narrative as a medium to visualize time through sequential frames makes it a valuable tool to explore spatial knowledge and representation in architectural education. This paper explores the spatial representation capabilities of graphic narratives using the concept of chronotope, and presents a practical exercise called "Narrative of Space" that can be used to promote spatial thinking and representation in first-year architectural education.

Highlights

- How Graphic Narrative as a form has the potential to represent architectural space and experience.
- Comparative reading of textual and visual narrative forms' chronotopic aspects.
- To construct a linear narrative based on the spatial experience of any given place and visualize it in a temporal context.

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Grafik anlatı aracılığıyla mekansal temsil: pratik bir yaklaşım

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Öz

Anlatı; zaman, mekan ve karakter gibi unsurları içeren bir üretim biçimidir. Bu üç unsur arasındaki ilişki; öznenin eylemlerinin zamansal bağlamda aktarımı olarak tariflenebilir ve sözlü, yazılı, görsel formlarda üretilebilir. Her bir formdaki farklı mekansal bilgi ise çeşitli araç ve yöntemlerle temsil edilir. Bakhtin'in anlatılardaki zaman/mekan birliğini tarifleyen "kronotop" kavramı, ilk olarak yazınsal anlatılarda tartışılmış fakat zamanla sinema ve grafik anlatı gibi türlerin çözümlenmesinde de kullanılmıştır. Özellikle grafik anlatının zamanı çerçevelere ayırıp görselleştiren bir form olması, bu formun mimarlık eğitimindeki mekansal bilgi ve temsiliyet tartışmalarını zenginleştirme potansiyeli açısından önemlidir. Bu makale, kronotop kavramını kullanan grafik anlatıların mekânsal temsil potansiyelini araştırmakta ve birinci yıl mimarlık eğitiminde mekânsal düşünme ve temsiliyet becerilerine katkı koymayı amaçlayan "Mekânın Anlatısı" adlı pratik bir egzersizi sunmaktadır.

Öne Çıkanlar

- Bir form olarak Grafik Anlatı'nın mimari mekânı ve deneyimi temsil etme potansiyelinin açımlanması.
- Metinsel ve görsel anlatı formlarının kronotopik niteliklerinin karşılaştırmalı okuması.
- Bir yerin mekânsal deneyimi üzerinden doğrusal bir anlatı kurmak ve onu zamansal bağlamda görselleştirmek.

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INTRODUCTION

Architectural representation of a building does not produce the transience of "perception in motion" and cannot create rhythmic image sequences as in movies; however, the use of the narrative technique in architectural representation has the potential to suggest certain temporal experiences (Croset, 1988). The present study places a theoretical, practical, and historical emphasis on the relationship between architecture and narrative and develops an approach to represent architectural space temporally for first-year architecture students.

Uluoğlu described architectural design through six phases that include site analysis, layout, development of the design idea, supplementary information, and constructed outcome (Uluoğlu, 2000). Although design is defined through a temporal process, it does not necessarily follow a linear and single direction with successive steps of analysis, synthesis, and evaluation, hence, creates novelty and distinctions through feedback (Melikeoğlu Eke & Usta, 2016). Despite such characteristics, the temporality of the design does not become a part of this process. Architecture's fundamental task, to provide us with our domicile in space, is recognized by most architects. However, the second task of architecture, to mediate human's relation with the fleeting element of time, is usually disregarded (Pallasmaa, 1998). In this respect, a user's experience of physical space with linear temporality is a subject that requires further discussion in architectural education and practice. Here, the narrative turns into an important instrument which can reproduce linear temporality through breaking it down. Narrative constructs reality through sub-scales such as the instant, duration, and sequence, and has the potential to create new relationships between the parts and the whole in terms of spatial representation. (Figure 1) Considering everyday life as a narrative, the user of the architectural space become the character and their actions illustrates more information about the time and space.
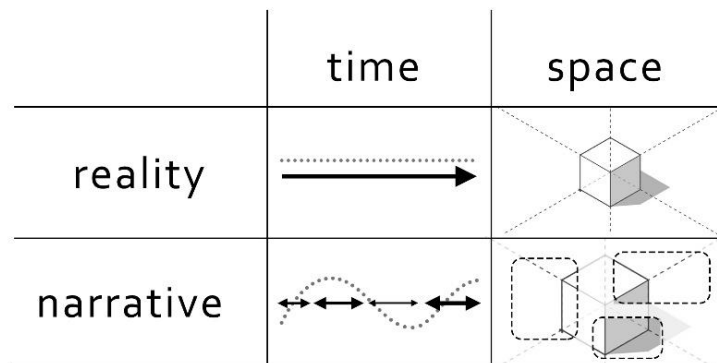
Figure 1 - Representation of space and time in narrative.

The processes in architectural design education, which require visual-spatial skills and awareness, are essential curricular subjects, due to their richness and significance in shaping discussions (Acar, Acar, & Ünver, 2019). Palmiero et al. (2010) emphasized that visual-spatial skills were important parameters in creative processes. The development of spatial awareness, which is one of the main objectives of the present study, is a factor that positively affects students' design skills. Xu (1999) argued that visual perception included three components: (1) spatio-temporal information that explains the motion of the objects in space, (2) attribute information that encompasses features of objects such as color, shape, texture, radiance, and (3) semantic information that includes categorical and distinctive data about the objects. Once the interaction between user, time, and three-dimensional space, which are the basic components of spatial awareness in architectural epistemology, is translated into the fictional universe of the narrative, it becomes the interaction between the character, time, and space. The present study, therefore, argues that students, who discern spatial qualities through the experience of a character as an external observer, will control spatial and temporal aspects better and experience architectural representation through a new layer constructed by the narrative. Thus, the present study was expected to enhance the spatial thinking, storytelling, mapping skills of the first-year architecture students, as well as their competency in traditional and digital visualization tools.

The concept of chronotope is considered essential for the present study due to its significance in describing the unity of time and space in narrative. The concept emphasizes the framing of the variables of time and space defining a character's actions in literary and visual narratives and becomes discernible due to the fragmented structures of narratives. The third section of the present study describes the concept in detail, with a particular focus on the broader scope of chronotopic qualities in graphic narratives compared to other literary and cinematic narrative forms. In this respect, the unique ability of graphic narratives to combine interaction, space, and movement has progressively influenced architectural representation. This tendency is observed in the increased number of studies in the academic literature on architecture in the last three decades, as well as in exhibitions that explore diverse associations between architecture and graphic narrative (Lus Arana, 2013). Brown has explained the potential of graphic narratives in architectural representation through the visual richness constructed by the unique style of a designer, as well as their ability to

construct a temporal context through successive frames that offer control to the observer (Brown, 2007). Similarly, Melanie van der Hoorn emphasized that architects prefer graphic narrative due to the broader range of possibilities compared to traditional architectural presentation and communication techniques (Van der Hoorn, 2012).

The discussion includes a comparison of spatial representation mechanisms in graphic narrative and other narrative forms, with an emphasis on the chronotope concept. The manuscript finally describes the "Narrative of the Space" exercise created for first-year architecture students at Eskisehir Osmangazi University, Turkey, which involved constructing a narrative in a given space and translating it into a graphic narrative form. The final work was evaluated based on a theoretical and technical framework, and the exercise's applicability is discussed.

ARCHITECTURE AND NARRATIVE

Narrative is a form of communication that describes a series of events triggered and experienced by characters (Jahn, 2005). Although narratology was first expressed as a scientific term in 1970s, it is a broad domain that dates back to Aristotle. Space, which was increasingly emphasized in narratology, referred to the environment where characters existed and were in motion. In this respect, space was reflected as an experience beyond a fixed "place" or "setting" and included all spatially situated objects and individuals (Dervişcemaloğlu, 2014). Narratives, literary or visual, include spatial information, which differs both in quality and quantity.

From the perspective of architectural epistemology, "Narrative in Space" can be defined as the daily life practices and spatial experience in a temporal context. Narratives are everywhere: for instance, they do not only exist in novels, but also in historical literature. Furthermore, everyone is a narrator in everyday life (Fludernik, 2009). The core of Ricoeur's narrative theory, as explained in his work, "Time and Narrative," includes a fundamental relationship between the narrative quality of time and human experience. Hence, in Ricoeur's theory narrative did not simply refer to verbalizing and redacting an event and/or experience, it was rather intended to understand, explain and communicate an action through the analysis of its structure and effects (Özatay, 2017).

A cross-section can be represented through the Russian director Sergei Eisenstein's approach to the temporal experience and meaning of a space. The detailed explanation of the relationship between architectural space and cinematographic montage by Eisenstein appeared through the Acropolis example in his text "Montage and Architecture". According to Eisenstein, the buildings of Acropolis, designed in antiquity, were constructed based on the concept of "architectural path" (Eisenstein, 1938). He did not perceive montage as a straightforward arrangement of images, sounds, and light on the filmstrip rather defined it as the organization of architectural and cinematographic images (Öztürk, 2014).
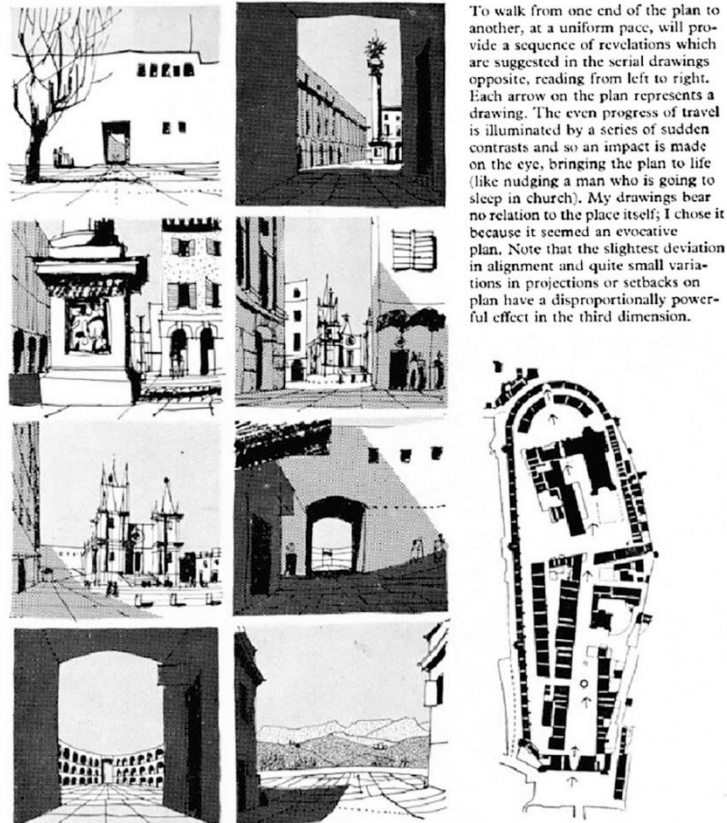
Another approach that addressed the concept of narrative in space as the experience of space through sequences was the "Promenade Architecture" of Le Corbusier, one of the prominent figures of modern architecture. Colomina (1992) emphasized that Le Corbusier considered the human body as a camera-eye in Villa Savoye and montaged the mobile experience in the space. Samuel and Jones (2012) contented that the novel space/time theories were one of the conceptual

driving forces of Villa Savoye and the ramp at the center of the project particularly transferred the architectural perception to a four-dimensional layer. Based on the awareness of the physical space, Le Corbusier's "Promenade Architecture" pursued the constant interaction of the individual and the surrounding environment. The articulated flow of experiences produced the holistic narrative, thus ensured certain awareness rooted in spatial and temporal references.

Bernard Tschumi translated Louis Henry Sullivan's expression "form follows function" to "form follows fiction," as a pun to emphasize that architectural design is an act of narrative construction (Tschumi, 2004). According to Tschumi, "architecture is not simply about space and form, but also about event, action, and what happens in space" (Tschumi, 1996). He developed an event architecture approach and instrumentalized it in his designs. He also attempted to transfer the diagrammatic method of Sergei Eisenstein from cinema to the architectural environment, which was used to construct space, event, and movement. Tschumi aimed to use the sequential construct of cinematic representation for the design of the movement and to transform architecture into an "event" by means of dynamic rendering (Güner, 2012). It is possible to interpret these sequential actions as narratives taking place in physical space.

Gordon Cullen's "Serial Vision" approach is also based on the experience of physical space in a temporal context, where the movement in an urban environment creates states of "here" and "there"(Cullen, 1971). Cullen used sequential drawings of urban environments to emphasize his approach, with each image including a user's perspective view and associations between frames to convey a sense of movement and transition. In an eight-frame drawing of a pedestrian's movement in Westminster, London, Cullen visualized the states of being "here" and "there" in a temporally interconnected and holistic experience, with the map next to the drawing clarifying the planimetric positions. (Figure 2)

Figure 2 - Cullen, *"Serial Vision," the opening page of the Casebook section of Townscape, 1961, by permission of Taylor & Francis Books, UK.*

The abovementioned approaches, which investigate the associations of narrative in physical space, form the backbone of the "Narrative of the Space" exercise developed for the students. Eisenstein's conceptualization of "visual path", Tschumi's action diagrams, and Cullen's "serial vision" were expected to particularly determine student attitude towards the problem of constructing a narrative on space. Hence, it is possible to assert that the way these three approaches described time through moment, duration and sequences and presented it through sequential images corresponds to the manifestation of the convergent relationship between the architectural epistemology and graphic narration.

CHRONOTOPE AND GRAPHIC NARRATIVE

A discussion on the representation of architectural space through narrative requires to scrutinize its associations established with reality. Bakhtin's concept of "chronotope" stems from the Greek words 'kronos' (time) and 'topos' (place) and refers to the spatio-temporal design in narratives, which concerns to the reproduction of human relations, everyday life, meanings and objects. Bakhtin explained the relationship of chronotopes with reality as follows:

"The most discernable characteristic of the chronotopes is the meaning they hold in terms of narrative. These "space-time" constructs are the core that organize the basic narrative events of the novel. It is where nodes of space-time

narrative connect and merge. It is possible to say with no reservations, the meaning that shapes the narrative belongs to these space-times." (Bakhtin, 2001).

Sözen (2008) explains this relationship as follows: action becomes tangible in a particular space and moment; space is located where the action takes place in a certain duration and time visibly manifests itself in space.

Bakhtin's work urges us to focus on the space-time settings of narratives. According to Clark and Holquist (1984), the projected and constructed chronotopes of the represented world emerge from the chronotopes of the real world. Thus, the chronotope is not a way of diverging from reality, it is a concept for managing reality (Clark & Holquist, 1984). From an architectural point of view, such relationship is the manifestation of the relationship between the physical and functional qualities of the space that surrounds us in everyday life and our actions. The connections between the narrative within reality and the reality within narrative appear as feedback mechanisms that ensure a better understanding of space and time.

Comparing different narrative forms is useful to identify the chronotropic aspects of graphic narrative. Graphic narrative, novel and cinema have very different stances with the concept of chronotope based on the means to construct the space-time information and to communicate it to its audience. Although the concept of chronotope was first discussed for literary works, currently it has become a research notion for various literary and visual narrative forms. For instance, in a highly acknowledged definition, it is argued that cinema is the art of organizing time and space (Jacobs, 1994). Given that cinema is based on visual ontology and intertwines space-event-time, the cinematic chronotope becomes one of the deterministic elements of the narrative. The concepts of place, space and time in cinema are prevailing and vital in creating the narrative's atmosphere and no director can abandon them (Sözen, 2008). As a type of visual narrative, graphical narrative also needs to construct the spatial and temporal context in which the character performs his/her actions to construct the universe of the narrative. Hence, it is essential to discuss the story/discourse layers in narratives based on time and space.

Narrative consists of two components: story and discourse. The difference between these layers could be described as the distinction between the universe constructed by the narrative and the reality in which the narrative is read/viewed. Such distinction based on time refers to the difference between the events experienced by the characters and their narrations. In this respect, "story time" focuses on for how long the events were depicted in the narrative (i.e., the duration) and is determined through the rhythm of the text, i.e., the pace of progress, and the clues in the text (Neumann & Nünning, 2008). "Discourse time," on the other hand, refers to the time required to narrate or read a text. The term "text" here refers to literary narrative, yet this distinction is also valid for other types of narrative. For instance, in a movie, the duration and temporal setting of the movie is different from the story time, and the temporality of a graphic narrative story differs from the temporality experienced by the observer based on parameters such as page design, frame size, text order, etc.

The difference between the story time/discourse time applies to the story space/discourse space in narration. The dimension of the events in the story encompasses certain time and space. Thus,

the "story space" includes the world presented in the frame and the implicit world outside the frame (Chatman, 2008). It is the space assumed to accommodate the characters and facilitate their movement and existence (Buchholz & Jahn, 2005). "Story space" is constructed through stimulating the reader with text or images in narrative content and is delivered to the reader through different strategies and tools in each narrative type. "Discourse space," on the other hand can be described as the physical environment in which the narrative realizes itself. Ryan's concept of "spatial extension of the text" explains the spatiality of the text as a material object and emphasizes the readers' relationship with the text interface (Ryan, 2012). In this respect, the spatial design of a page, movie frame, or graphic narrative page determine the characteristics of the "discourse space" (Figure 3).
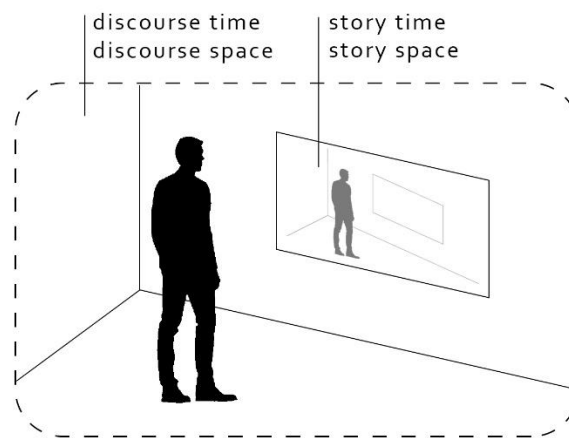

Figure 3 - *Story and discourse layers in narrative.*

Based on the concept of chronotope, the unity and organization of story/discourse time and story/discourse space emerge as elements that directly affect the reader's perception towards the space/time information of the narrative. Hence, the approach to time and space in graphic narrative and the skills in their representation are different compared to the visual narrative produced by the motion image and the literary narrative. The tangibility and visibility of time mentioned by Bakhtin in his chronotope definition, find a response in graphic narrative through the observability of time in the spatial relationship between frames, as argued by Vice (2001) and McCloud (1993). Each frame of a comic demonstrates a single moment, creating the illusion of time in motion and the observer's mind fills the gaps between these frozen moments (McCloud, 1993). The essential connection of time and space produces both the narrative and the entire complex structure (de Souza, 2017).

Such difference becomes clearer once the story space is discussed based on its construct and representation in narratives. In literary narrative, space is mostly constructed through a descriptive approach. Spatial features, which are inherently static, are implicated through their descriptions for visible boundaries and distinctive features of the objects (Neumann & Nünning, 2008). The spatial image formed in the mind of the reader is associated to his/her visual memory, and the totality of the spatial experience remains at a partial level of sensation. Cinema, on the other hand, builds a universe through the motion and flow of images. It is a form that employs Eisenstein's "visual

path" method, in which pieces of time within a limited frame implicate the chronotope. "Discourse space" in cinema is mostly a screen/surface/frame with defined dimensions and the spatial information is represented as a perspective within. Correspondingly, "discourse time" in cinema is linear and limited with the duration of the movie.

In graphic narrative, frames capture a moment and are arranged spatially, leaving the temporal sequence to be constructed by the reader. The distribution of narrative content into multiple scenes is done through framing devices. These frames are the images that distribute the narrative content into multiple scenes, which are separated via framing devices (e.g., architectural features) (Steiner, 2004). This means that the "discourse time" is produced by the reader, while the "discourse space" is represented on a surface through the organization of frames with diverse sizes and qualities. Such a viewpoint suggests that graphic narrative has extensive potential in representing the "story space."

Lefevre discusses space in comics on three levels: inside each frame, in the interconnection between frames and in the interconnection between the narrative and the real world. Story space is created by the reader through the combination of elements visible inside the frame and the elements that are outside (offscreen) (Lefevre, 2006). Parallel to architectural representation, graphic narrative is based on a 3-dimensional depth illusion created on a 2-dimensional surface to create the sense of a space. Also, there exist works of graphic narrative that included architectural representation tools such as plan, section, cross-section perspective, intended for a holistic perception of the space. In particular, the use of architectural representation in Chris Ware's graphic novels allows the reader to conceptualize different angles of the chronotope, with frames that transcend the linearity of space/time and bring the language of the narrative closer to architectural representation.

Furthermore, the construction of the space in graphic narrative does not only define the spatial qualities related to action. The architectural qualities of the inhabited space can also inform the reader on the personality of the character. Based on the theme of the story, narratives can express a certain atmosphere or symbolize an underlying concept, a scene, or even a complete story (Lefevre, 2006). The theme and atmosphere produced through the visual language of a graphic narrative are particularly significant, as they directly affect the story and spatial knowledge.

Each narrative form provides a wide range of thinking both to the creator and the reader based on the interpretation of space/time. Figure 4 summarizes the means to comparatively read the "story time/space" and "discourse time/space" in novel, cinema and graphic narrative based on their tools/methods, form, and quality.

			Text (Novel)	Moving Image (Cinema)	Static Image (Comics)
			TEXTUAL NARRATIVE	**VISUAL NARRATIVE**	
STORY	time	tool/method	**moment, time, sequence**	**moment, time, sequence**	**moment, time, sequence**
		form	**fragmental**	**fragmental**	**fragmental**
		quality	**flexible**	**flexible**	**flexible**
	space	tool/method	description	photo/graphic representation	graphic represantation
		form	fragmental	fragmental	fragmental
		quality	partial	partial + whole	partial + whole
DISCOURSE	time	tool/method	**to read**	**to watch**	**To read, watch, look**
		form	**linear, limited**	**linear, limited**	**crosswise, expandable**
		quality	**repeatable**	**Not repeatable**	**repeatable**
	space	tool/method	text	image	text + image
		form	page	screen	page
		quality	solid	solid	flexible

Figure 4 - *Construction of story and discourse layers in different types of narrative.*

Parameters, which were assigned comparatively in each column, indicate that utilizing graphic narrative as a tool of spatial representation creates a temporal feeling from fragmentary static images, and the information about time and space is simultaneously constructed by the reader. That process forces the reader to be active and take the initiative to knit this three-dimensional space in their mind as a patchwork, using their time and will. The same mechanism works for the story time of the narrative. On the other hand, giving these pieces to the reader in a meaningful way is the main struggle to create an architectural graphic narrative. Starting from the experience of the physical space, defining chronotopes and ordering them in a reasonable spatial/temporal chronology, and representing them as a visual product is a complicated design problem. The "Narrative of Space" exercise detailed in the next section aims to provide an approach for first-year architecture students to be able to use graphic narrative as an architectural representation tool in a proper way.

REPRESENTATION OF THE SPACE THROUGH GRAPHIC NARRATIVE

Considering the entire background regarding the relationship between architecture and graphic narrative, the exercise was developed for first-year architecture students to improve their skills in comprehension of architectural space and representation simultaneously. The exercise was carried out with 30 students, through individual and group sessions, during the Spring semester of the

2018 and 2019 academic years in the Department of Architecture, Eskisehir Osmangazi University, Turkey.

In the "Narrative of Space" exercise, which was considered an approach to read, understand, and visualize an existing space, students were expected to develop narratives in a public urban setting and translate them into a 2–3-page graphic narrative based on given templates. Literary narrative, graphic narrative, drawing, photography, and digital tools (Photoshop) were used throughout the exercise. The narrative and discourse layers of the graphic narrative mentioned in previous section, basically transformed into two stages of the developed exercise. Students are expected to build a narrative with its own space/time information and visualize it as a final product, considering its spatial/temporal configuration for the reader. (Figure 5)
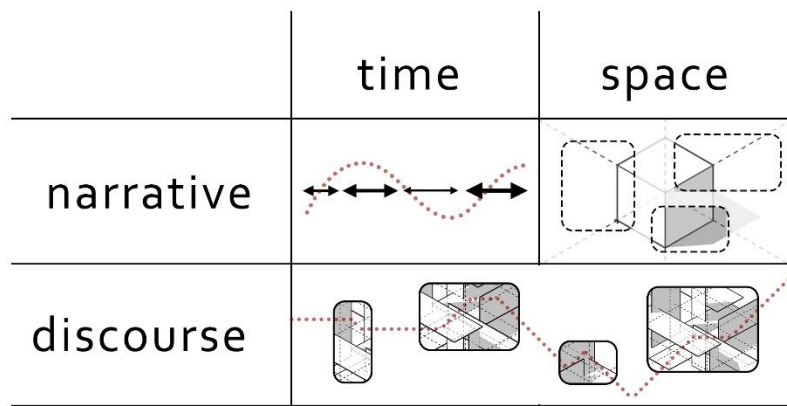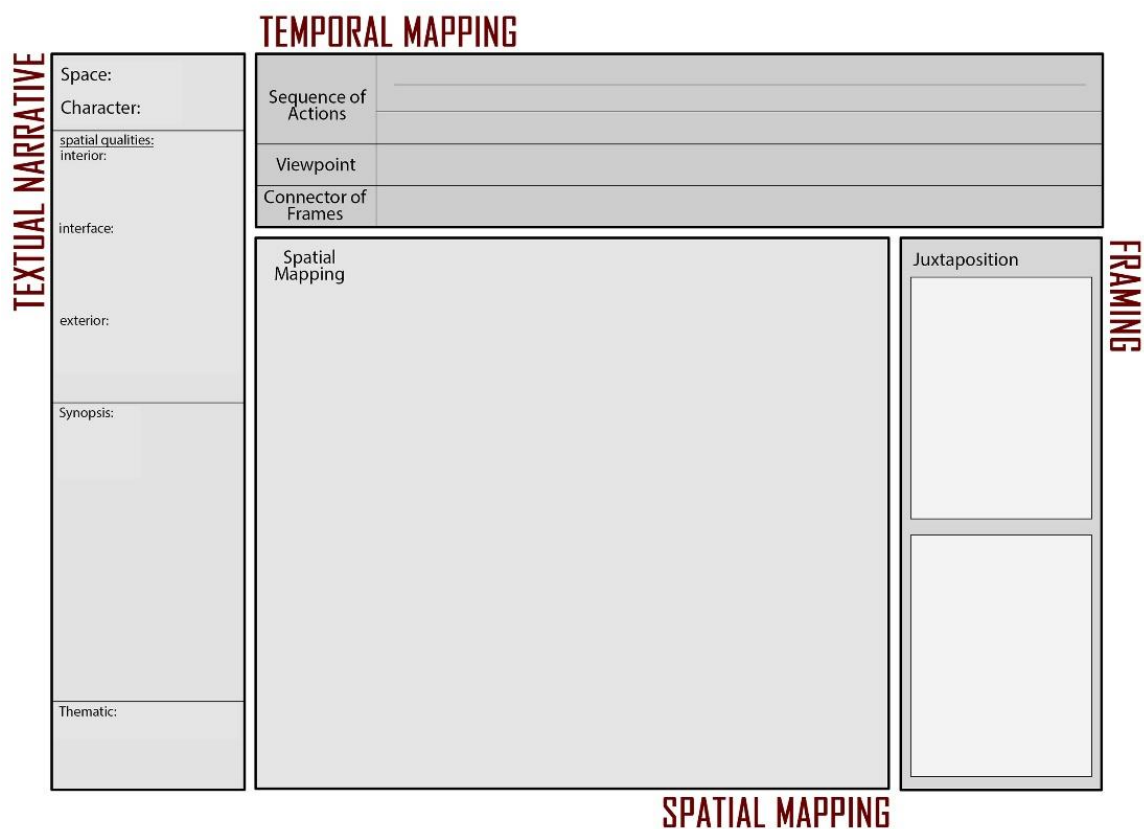

Figure 5 - Representation of space/ time as discourse layer in graphic narrative.

In other words, these two phases are defining the chronotopes in the space, and translating these chronotopes into sequential images. During the first phase, defining chronotopes involved ensuring that each sequential action taking place contained information about its relationship with space and time. For example, if a character walks towards a building, the duration of the walk and the spatial qualities of the environment should be included in the exercise. Other actions, such as entering a door or waiting for a friend under a canopy, also needed to be described. The user's linear experience of the space transformed into action sequences and should be mapped onto the template simultaneously. It is essential to include chronotopic elements belonged to the exterior, interface, and interior spaces. The narratives were expected to have a narrow scale and limited series of actions temporally. The sequence of actions, established as a simple linear narrative, should be based on reality and refer to "now" and "here". Fundamentally, the focus should be on the chronotopes defined by moment, duration, and sequences to communicate the highest amount of information on the status of the space.

In the second (discourse) phase, visualizations and the graphic narrative pages were digitally produced based on the mapping created in the first phase. The organization of the panels and the composition of the final product (discourse space) should contain all the data collected in a concentrated way and allow the reader to understand the narrative space by following the pages.

The Narrative Phase – Defining the Chronotopes

Initially, students selected their study area from predetermined public spaces in the urban setting: Eskişehir Train Station, ETI Archeology Museum, Haller Youth Center, and the Anadolu University Library. They used an A3 size printed Narrative Template to construct their narratives, based on the interactions of a character with the chosen public space through the chronotopes during their site visit. The students mapped the character's actions, moments, duration, position on the map, and visual framing means simultaneously on the Narrative Template. They recorded the character's action sequences and various characteristics of the space textually in the template. (Figure 6).

Figure 6 - The narrative template.

The **Textual Narrative** part on the left of the template was used to note down significant data and details on the spatial qualities of the exterior, interface, and interior environments. The Chronotope Sequence should be treated as a synopsis of the narrative text. Furthermore, the thematic decisions based on the visual setup of the graphic narrative should also be noted to construct the final product.

In the **Sequence of Actions** in the Temporal Mapping part, the students chronologically organized the interactions between the actions and space through simple diagrams that included proportional information for time, and wrote down the definitions of each action below its representation. The

Viewpoint part referred to how each chronotope would be represented in the graphic narrative and defined the viewpoint to be framed. This part should include decisions on the representation of the action, such as from the rear in a wide angle or as elevation in a vertical frame. The **Connector of Frames** at the bottom was used to represent the common spatial element that the two consecutive frames should contain, enabling the observer/reader of the graphic narrative page to orient themselves. Thoroughly, these connector references were expected to represent the nodes that allowed the graphic narrative to form a spatial pattern.

The **Spatial Mapping** part of the template planimetrically and sectionally recorded the movement of the character, starting from the exterior space. The students sketched spatial maps without any scale information, incorporating chronotope locations and camera viewpoints.

The **Framing** part used consecutive thumbnail sketches of the visual representation of each chronotope on the page. The students considered parameters such as the size of each frame, horizontality/verticality, and the connector reference elements simultaneously, using photographs shot on the scene to make visualizations. The graphic narrative page created in the Framing part was used as a base for digital production.

Once students completed all parts of the template and delineated the narrative outline, they took photographs from right angles to produce the graphic narrative. In the second phase, they used these photographs as a foundation in Photoshop and reproduced them in graphic format through the photocontour technique. Finally, the students completed a 2 to 3 A4-page graphic narrative based on the information embedded in the narrative template.

Discourse Phase – Visualisation of the Narrative

In this phase, it was important that the resulting graphic narrative pages clearly conveyed the spatial information, and the visual language was suitable for the narrative theme. Thus, a novel method of graphic representation based on spatial photographs was applied. Ben Katchor argued that the representation of space in graphic narrative is stronger compared to photograph, as it is a conceptual representation and produces a motivational sense of the space (Brown, 2007) Also, a drawing with reference to spatial photograph serves the narrative more accurately since it provides opportunities such as reducing or highlighting certain elements.

Here, it is also essential to emphasize the relationship between the formal structure of graphic narrative and architectural representation. These two approaches, aimed to produce a sense of 3-dimensionality through linear elements on a 2-dimensional surface, are most convergent in the concept of "La Ligne Claire" (Clear Line). This movement, started by Herge, the creator of the renowned comic Tintin, includes character and space drawings using homogeneous lines with no changes in line weight (Lus Arana, 2013). There exist several artists and architects who currently follow this style that reflects a character's action as a clear perspective in the Cartesian space.

The "Photocontour" method developed within the scope of the present study also prioritized representation approaches based on the "Clear Line" style. First-year architecture students, who were not skilled enough in free-hand drawings of space, were expected to produce each frame using clear lines, using the spatial photographs as a foundation in the digital environment. Hence, the

students traced the contour lines on the photographs to obtain the perspective of the space on a separate Photoshop layer and a clear graphic representation was achieved once the photograph layer was removed. Furthermore, elements such as figures, shadows and texture/color were visualized in separate layers. Such tools were developed to highlight the spatial information in photographs, to eliminate unnecessary details and to allow the observer focus more on the chronotopic information (Figure 7).

Figure 7 - *Photocontour method.*

Each frame of the graphic narrative pages, drafted in the narrative template, was completed in Photoshop through photocontour method. The students were informed that the decisions based on figures and color-texture should strengthen the narrative and the use of a text box or speech bubble was optional. The students were expected to submit a final work of 2 to 3 A4 pages of graphic narrative with strong visual integrity and the consecutive frames should deliver a certain set of information on the space.

Final Works of The "Narrative of Space" Exercise

After a two-week exercise, a total of 12 final works were produced to represent the assigned spaces through the chronotope concept and graphic narrative. The evaluation criteria were based on the effective use of the Narrative Template items and parameters. For instance, the ability to connect spatial data in the narrative text with the character's actions in the action flow table, to diversify the decisions on viewpoint to create a rich spatial perspective, and to include necessary references in the spatial mapping table were considered important. Some of the final works were notable for their processing of the Narrative Template, while others were significant for their spatial representation in the Graphic Narrative pages. However, some of the final works lacked necessary detail in the photocontour phase due to time constraints. Ultimately, a functional mechanical relationship between the Narrative Template and the Graphic Narrative pages was highly valued in the evaluation of the final works.

Discussing the final graphic narrative pages without the narrative template is also important to evaluate if this exercise has been useful for the students in terms of spatial representation. Overall, it seems that most of the work has been able to understand the given space and represent it in a temporal context. Firstly, the continuity of the panels is clear and watching them sequentially creates a sense of spatial unity. However, the products which use architectural elements as

connectors between consecutive panels help us orient ourselves as readers and understand the narrative space better. Especially the pages that use prominent landmarks such as stairs, entrance doors, and big trees as connectors provide contextual information about the space. Thinking about the viewpoint in each panel, in most of the narratives, the angle of the camera doesn't change. Viewing the narrative space from the same angle decreases three-dimensionality and creates a route-like environment. Also, in terms of spatial inputs, when the sizes and proportions of the panels are similar, the whole narrative becomes homogenous. These monotonous compositions also hinder understanding of the chronotopic aspects of these examples. The feeling of the camera following the character prevents us from understanding the interaction of the character with space and time. At the same time, some pages contain a couple of close-up shots in addition to wide-angle views, and thanks to that, the reader can make connections between the actions of the character and the function of the space.

Additionally, non-monotonous discourse space compositions appear in the opening scenes of almost all the works. The first panel of each narrative presents a horizontal, wide-angle perspective, providing an overall view of the building and its surroundings. Subsequent panels then move closer to the building, indicating the location of the entrance, the relationship between open and semi-open spaces, and how the interior and exterior are separated from each other. However, the moment of entering the building is not clearly depicted in almost every narrative, resulting in a loss of an important chronotopic threshold. While approximately half of the panels in each narrative show the exterior space and the other half show the interior, this approach can result in some panels feeling repetitive due to the architectural characteristics of the space. However, some examples that modify the size and ratio of the panels according to the represented space function better as discourse and narrative space. Using a horizontal frame to show a low-rise building from the exterior or a walking scene as a side view, and using a vertical frame to show an atrium of the building is meaningful because it allows for the attributes of narrative space and discourse space to overlap. Additionally, the page compositions of these examples seem more dynamic and engaging.

Unfortunately, the graphic narrative pages lack clear themes and visually distinctive styles, falling short of the expected level of definition. Using colors to highlight some architectural elements and connectors works well in some examples but almost none of them illustrates how the light affects the space, for instance. That is also important to show the reader what time of the day the narrative takes place. While the narratives succeed in representing the Cartesian qualities of space, such as its dimensions and geometrical relationships, they fall short of capturing the atmospheric qualities, such as the lighting, materials, and textures, that are crucial for creating a comprehensive and immersive sense of space.

To discuss the outputs of the exercise separately by narrative template and graphic narrative pages, the final work of K1, which focused on the Anadolu University Library, correctly used the Narrative Template to construct the chronotope and mapping. The three-page Graphic Narrative had a high level of clarity in presenting spatial information and utilized a proper visual language as style, making it the final work that achieved the expected exercise outcomes the most, as shown in Figure 8. The study's positive qualities included the harmony between framing and the quality of frames, as well as the use of connector references that facilitated spatial orientation. However, the character's eye-level and unidimensional viewpoint in each frame made the narrative somewhat

static. Additionally, the duration of action in the space was not represented in either the Narrative Template or the Graphic Narrative, leading to a negative evaluation in terms of the chronotope concept. Overall, the K1 final work was one of the outcomes that closely responded to the exercise aims by clearly and accurately constructing the spatial information of the immediate vicinity of the library building, interface, and interior through sequence-images.
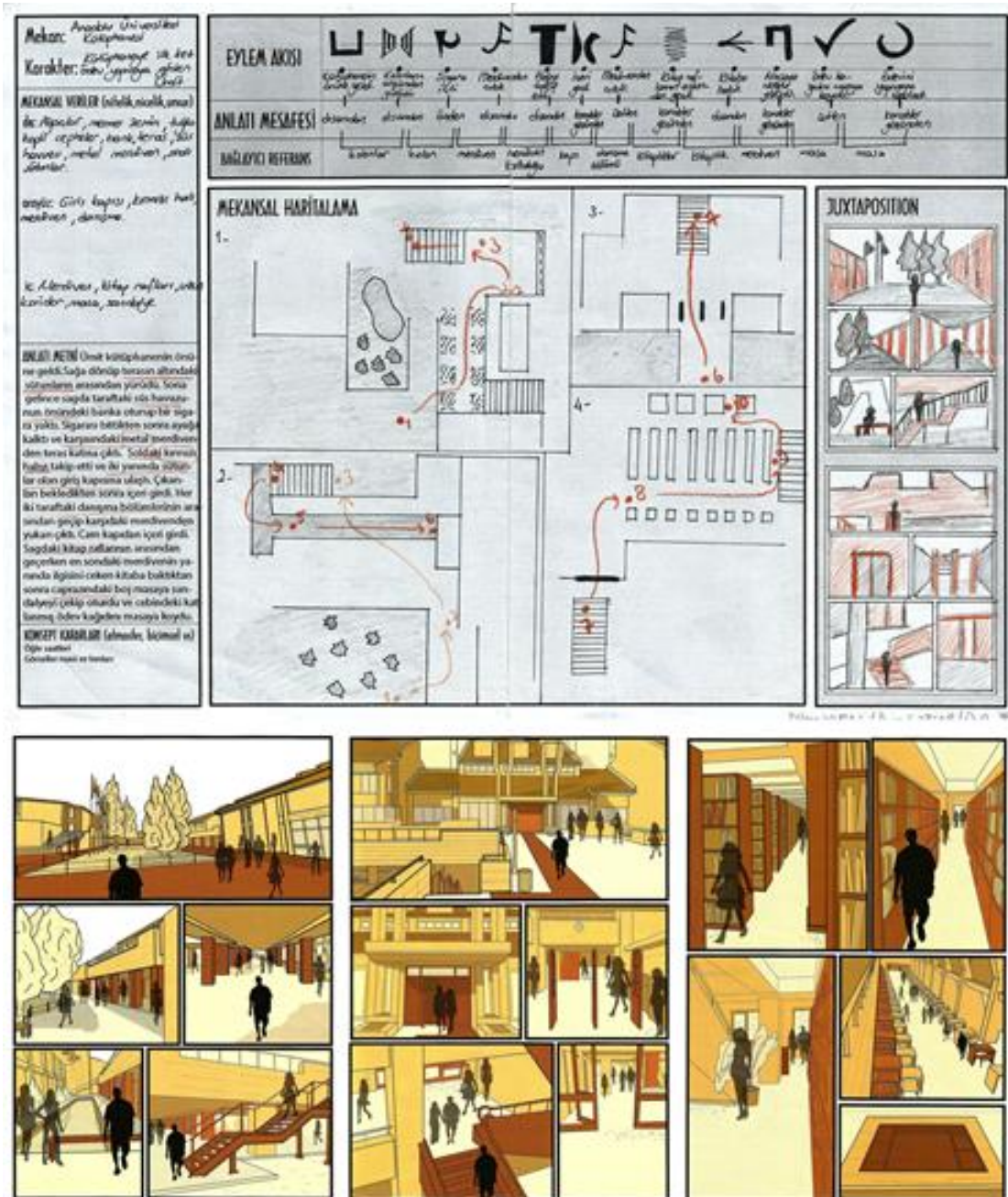

Figure 8 - Narrative template and graphic narrative pages of the k1 final work (Dilara Vural, Omer Cagsar, Umit Yalıc)

The E1 final work, focusing on the ETI Archeology Museum, used the temporal and spatial mapping sections in the Narrative Template accurately and stood out due to its dynamic construct for framing (Figure 9). E1 was an individual work, thus utilized collage technique along with the photocontour technique in the Graphic Narrative pages due to the time constraints yet was successful in adapting the graphic language to the theme. However, E1 could be further developed based on the use of connector references and spatial representation.
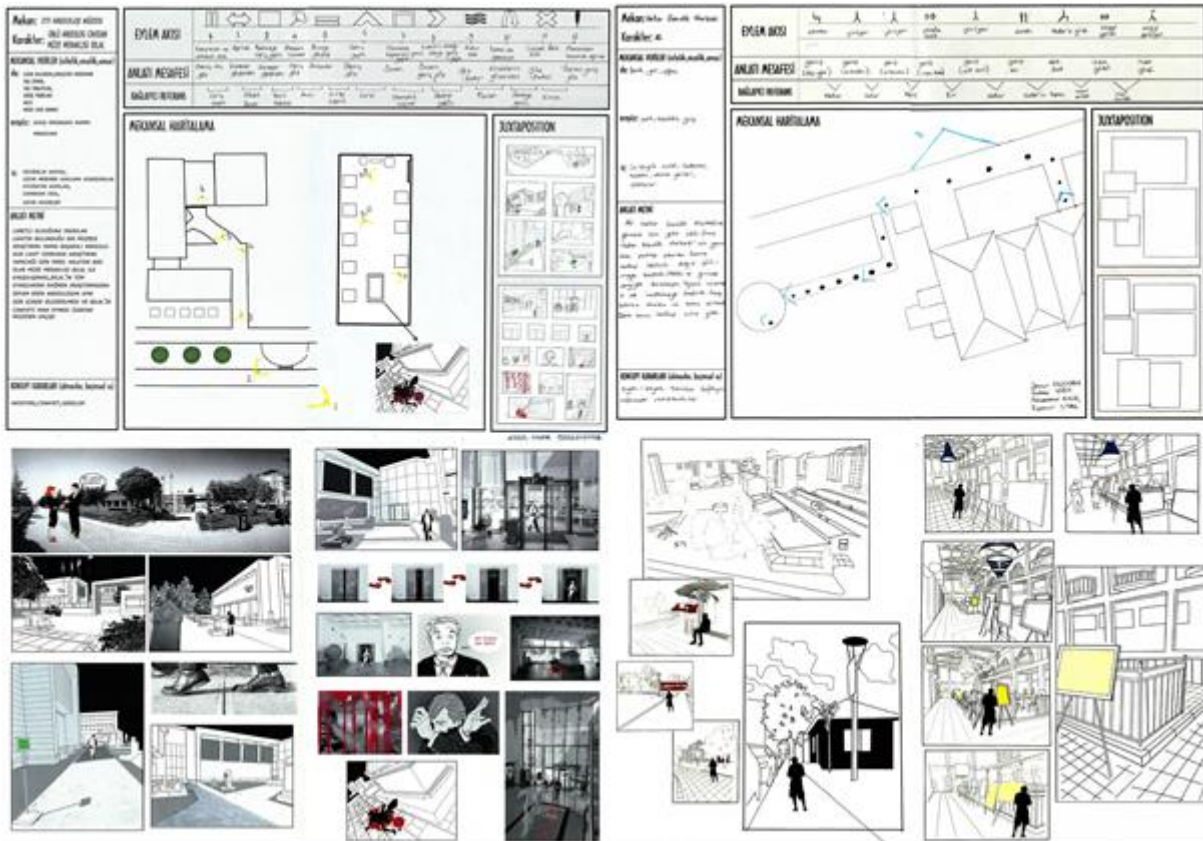

Figure 9 - E1 final work (Aysel Cicek) and H1 final work (Şennur Ficicioglu, Fatma Yigit, Ferdanur Kilic, Busranur Citak).

The H1 final work was considered noteworthy in terms of using an opening frame with an aerial view and for frame organization, however, used static sequencing for the interior space frames and could not capture the viewpoints that could function with the narrative (Figure 11). Such setback was due to ineffective use of the spatial mapping tool in the Narrative Template. A holistic examination of the final works indicated that the final works that effectively used the Narrative Template in constructing the chronotope obtained more successful results in their Graphic Narrative pages.
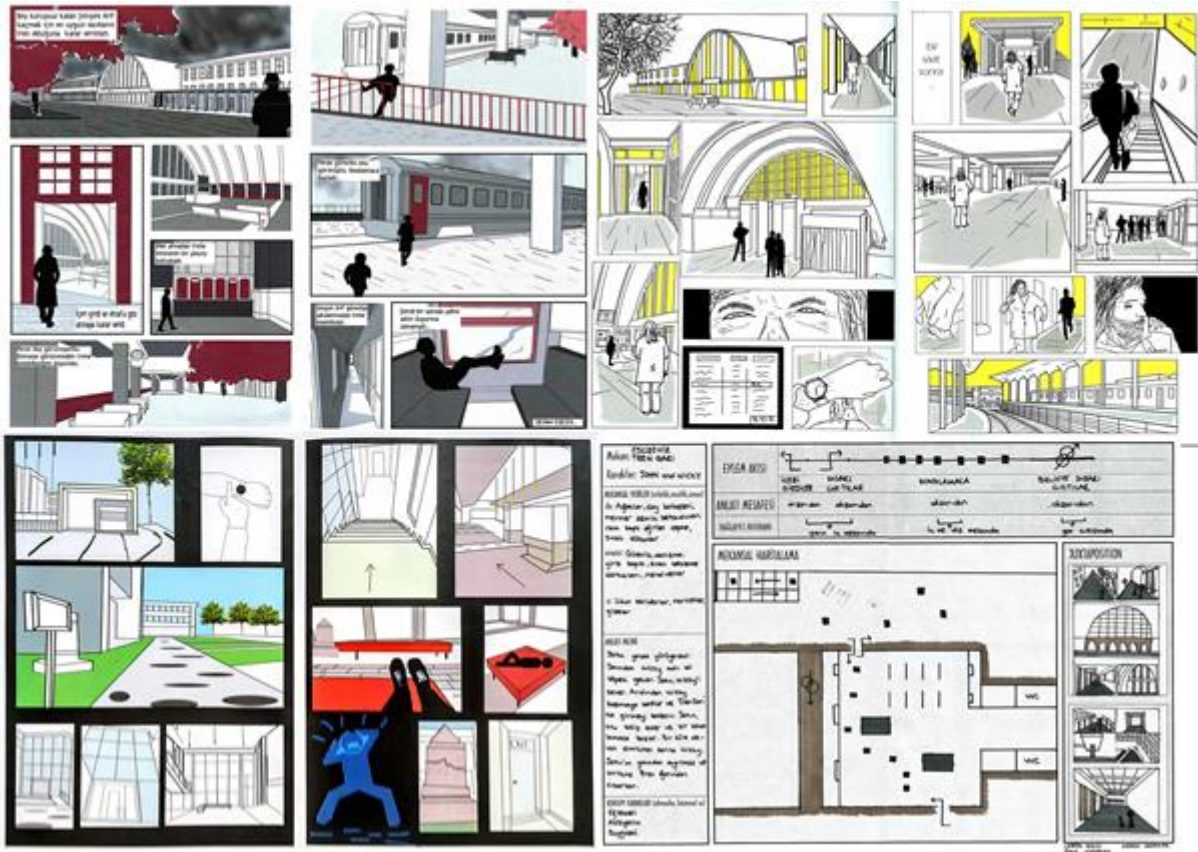
Figure 10 - Examples of other final works (Hande Bezgin, Ceren Özkul, Rabia Karabörk, Kerem Kuşpınar, Duygu Er).

CONCLUDING REMARKS

The relationship between graphic narrative and architecture is a relationship of mutual nurture and has diverse potentials of expansion based on form/content. The present study particularly discussed the theoretical background and development process of the "Narrative of the Space" exercise, which aimed to contribute to the spatial comprehension and representation skills of the first-year architecture students. The final works of the exercise, which positioned the chronotope concept at its core, were considered significant in terms of including the knowledge of both disciplines.

Given that the "Narrative of the Space" exercise was the first step of a more comprehensive study, it was carried out in a limited time and the works were not developed through individual feedback. It is expected that a longer Narrative Template phase with adequate feedback might enable further development of chronotope in narratives and could lead to a more detailed and organized presentation in the graphic narrative pages. Furthermore, the study design targeted first-year architecture students, even though their skill sets would lead to certain technical limitations. Architecture students in senior classes might obtain better outcomes through the exact use of tools and further comprehension of spatial characteristics. It is possible that the approach of the present study could fill an important gap in conveying the spatial knowledge, particularly in the contextual/spatial analysis phase of architectural design courses. The hybrid use of digital and

traditional tools has the potential to provide an enhanced expression of the character-space interaction in each frame and strengthen the narrative.

A common problem in the final works of the exercise was the illegibility of the character's actions in graphic narratives as denoted in the Narrative Template. The use of digitally ready human representations resulted in limited variability. For instance, a character described as reading a book on a bench in narrative was represented standing in the graphic narrative pages, thus the desired effect was not achieved. Correspondingly, varied perspectives in frames were considered a factor that could strengthen spatial expression. Several works indicated that students had a tendency to take photographs only from eye level, and the camera frame only followed the character's path. Such decisions led to a monotonous flow in the graphic narrative and could not produce adequate information on the total interior volumes since the spatial information belonged to a single direction. Furthermore, parameters such as wide/narrow angle, horizontal/vertical frames were the key factors that were disregarded in several studies.

Nevertheless, the outcomes and the achievements of the final work were acceptable for first-year architecture students. The findings of the present study indicated that certain updates to the exercise design could be more effective, and the outcomes could be evaluated through further studies. While conducting an improved version of the exercise with senior architecture students is preferable, it is essential to extend the exercise period and encourage student involvement through feedback sessions. Furthermore, conducting narrative and chronotope analyses through known graphic novel examples might contribute to the process. By examining how time and space are represented in existing graphic novels, students can gain a deeper understanding of how these elements work together in a successful narrative. They can also learn how to analyze and break down a narrative into its different layers and components and learn what works and what doesn't in terms of representing architectural space through a graphic narrative. It is also possible to shift the 2 to 3 A4 pages submission to the size of an architectural presentation board, which might help extend the boundaries of the exercise and bring graphic narrative and architectural representation closer, not only formally but also mechanically. Particularly as in Chris Ware's graphic novels, embedding architectural representation methods directly into the graphic narrative could result in more productive outcomes. Further studies aim to render architectural tools such as plan, section or section-perspective as a temporal part of the narrative. By incorporating these elements into a narrative structure, students can represent an experience that unfolds over time and allows users to engage with the space in a more dynamic and immersive way. For example, a section drawing might be used to show how a user's experience of a space changes as they move through it, or a plan might be used to show the progression of a character's journey through a building.

Although the findings and suggestions mainly focus on the re-representation of the physical space, they are also valid for the approach that aims to use narrative as a space design tool. However, it is a detailed discussion for further studies.

Narrative as the fundamental approach and the relationship of graphic narration with architecture as the specific approach delineate a novel study domain and does not have extensive academic or practical reflections yet. Increased publications in the domain lead to more visible potentials in theoretical and practical constructs and indicate a significant field of study. Given the importance

of interdisciplinarity in architectural education and profession, such novel approaches are highly inspiring and stimulating for curriculum development and to establish stronger links between theory and practice.

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*There is no conflict of interest for conducting the research and/or for the preparation of the article.

Ethical Statement

I confirm that the article 'Representation of Space Through Graphic Narrative' was written with full consideration to ethical norms and all consents were received from the participants.

Copyright Statement for Intellectual and Artistic Works

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Author Contribution Statement

A. Fikir / Idea, Concept	B. Çalışma Tasarısı, Yöntemi / Study Design, Methodology	C. Literatür Taraması / Literature Review
D. Danışmanlık / Supervision	E. Malzeme, Kaynak Sağlama / Material, Resource Supply	F. Veri Toplama, İşleme / Data Collection, Processing
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